

REMARKS

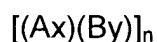
Claims 1-5 have been cancelled. New Claims 26-45 have been added. Claims 6-25 have been withdrawn from consideration by the Examiner. Hence, Claims 26-45 are active and under consideration.

REQUEST FOR RECONSIDERATION

Thermosetting polymers offer enhanced mechanical and thermal properties compared to thermoplastic polymers for many applications, however, the former cannot be readily processed into finished products using widely used processing techniques as are used with thermoplastic polymers.

Advantageously, the present invention as defined in New Claim 26 affords soluble copolymers which are thermosetting, which renders them quite susceptible to facile processing for subsequent use.

In particular, the present invention provides a soluble copolymer made of units of vinyl monomers; the soluble copolymer having the formula:



wherein:

A is a vinyl monomer containing single unsaturation;

B is a vinyl monomer containing multiple unsaturation; and

x, y and n are each a integer having a value of greater than 0.

Claims 1-3 and 5 are rejected under 35 U.S.C. §102(b) as being anticipated by Trieselt et al. '215. However, this reference fails to either disclose or suggest the present invention.

Notably, Trieselt et al. describe the inclusion of many polymers, such as polyhydric alcohols or water-soluble polyalkylene glycols in the preparation of a detergent, which is biodegradable.

Clearly, one skilled in the art would not be put in possession of the soluble copolymer as claimed in present Claim 26 from this reference.

Notably, the water-soluble copolymer of Trieselt et al. contains units of one or more monoethylenically unsaturated C₃-C₆- monocarboxylic acids, and also one or more comonomers which contain two or more ethylenically unsaturated non-conjugated double bonds which are derived from esters obtainable by esterification of (b1) monoethylenically unsaturated C₃-C₆- monocarboxylic acids with (b2) polyhydric C₂-C₆ alcohols, water-soluble or water-insoluble polyalkylene glycols having a molecular weight of up to about 400, water-soluble polyalkylene glycols having a molecular weight of from about 400 to 10,000, polyglycols having a molecular weight of up to 2,000, polyvinyl alcohol having a molecular weight of up to 10,000, and monohydric, monoethylenically unsaturated C₃-C₆ alcohols or mixtures thereof. See Claim 1 of this patent and the specification.

Clearly, the soluble copolymer of present Claim 26 does not contain units of the (b2) component of Trieselt et al. Further, the (b2) component of Trieselt et al. is included to promote biodegradability, while the overall polymer of this reference is used as a builder in detergents to help boost the washing action of surfactants in the detergent.

One skilled in the art would not be put in possession of the soluble copolymer of Claim 26 by this reference. Further, one skilled in the art would have no motivation to exclude the (b2) component of Trieselt et al. in an effort to obtain the soluble copolymer of Claim 26 having a completely different utility, i.e., a thermosetting polymer having facile processability for subsequent use.

That the soluble copolymer of present Claim 26 represents a thermosetting polymer which can be easily processed for further use may be seen, for example, from Example 14 at pages 11-12 of the present specification. Example 14 shows the ease with which an exemplary polymer, poly(methyl methacrylate-ethylene glycol dimethacrylate) is dissolved in dichloromethane along with hydroxy cyclohexyl phenyl ketone as a photoinitiator and cast as a thin film on a silicon wafer using the Langmuir-Blodgett technique. The polymer was then crosslinked using UV irradiation to afford a cross-linked thin film.

Clearly, such a use would not benefit from the inclusion of the (b2) component of Trieselt et al. in the uncrosslinked polymer as the addition of such units would only reduce the number of sites available for crosslinking for subsequent produce formation, and

would, in all likelihood, interfere (with abundant free hydroxy groups) with subsequent crosslinking.

Clearly, one skilled in the art would not be put in possession of the soluble copolymer as claimed in present Claim 26 from this reference.

Hence, this ground of rejection is unsustainable and should be withdrawn.

Claims 1-3 and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Matz et al. '715. However, this reference fails to either disclose or suggest the present invention.

Notably, Matz et al. merely disclose cross-linked ampholyte polymers for treating hair, skin or nails, which contain other types of polymers.

In particular, Matz et al. describes the formation of a polymer containing:

- a) about 20-95 mol % acrylamidopropyl trimethylammonium halide, methacrylamidopropyl trimethylammonium halide, methoxyloxyethyl trimethylammonium halide, methoxyloxyethyltrimethylammonium methylsulfates, acryloyloxy ethyltrimethylammonium halide or dimethyldiallylammonium halide;
- b) about 5 to 80 mol % of acrylic acid, methacrylic acid, 2-acrylamide-2-methylpropane sulfonic acid or 2-methacrylamide-2-methylpropane sulfonic acid;
- c) about 0.0001 to about 1 mol % N,N'-methylenebisacrylamide triallylmethylammonium chloride, allylmethacrylate, N-methylol acrylamide, polyethylene glycol dimethacrylate, ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, 1,6-hexanediol dimethacrylate, and allylsucrose; and
- d) about 1 to about 50 mol % of C₁-C₃ alkyl methacrylate, C₁-C₃ alkyl acrylate, acrylamide, N-alkylacrylamide, methacrylamide, N-alkyl methacrylamide, and diacetone acrylamide.

Clearly, the soluble copolymer of present Claim 26 does not contain units of component (a) above, and, in any event, contains only a mixture of vinyl units A and B as defined in present Claim 26.

Clearly, one skilled in the art would not have been motivated to exclude such other polymers in order to obtain the soluble copolymer of Claim 26.

Hence, this ground of rejection is unsustainable and should be withdrawn.

Claims 1-5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Huang '901. However, this reference fails to describe or suggest the present invention.

Notably, this reference describes a matrix material containing a polymer which may be made of units of any of the monomers recited in Claim 2 and in paragraph [0065] of the specification thereof.

However, this reference describes the use of polymers made from such monomers as a surface imprint. Examples 2 and 4 at paragraphs [0137] – [0145] are illustrative. In these Examples, polyacrylamide is used to prepare a surface imprint which is used in Example 5 to capture Cytochrome C.

Further, paragraph [0012] describes, in part, that examples of matrix materials are:

...heat-sensitive hydrogels such as agarose,
polymerizable monomers such as acrylamide, and
mixtures of polymerizable monomers and cross-
linking agents.

Clearly, one skilled in the art would have no motivation from this reference to construct the soluble copolymer of present Claim 26, which necessarily contains units of vinyl monomers having single unsaturation, and units of vinyl monomers having multiple unsaturation. As noted above, it is this assembly of units in the soluble copolymer which renders it susceptible to facile processing for subsequent uses even though it is a thermosetting polymer.

Hence, this ground of rejection is unsustainable, and should be withdrawn.

Finally, separate consideration is urged for dependent Claims 27 and 28, directed to a sub-genus of monomer units for each of vinyl monomers A and B, respectively, and Claim 45.

Separate consideration is also urged for dependent Claims 31-41, directed to single copolymers. None of these is either disclosed or suggested by any of the cited references, either above or in combination.

Additionally, separate consideration is also urged for dependent Claims 42-44, directed to specific physical forms of the soluble copolymer of Claim 26, i.e., films or membranes, microparticles and nanoparticles.

Claim 4 stands objected to under 37 C.F.R. §1.75(c).

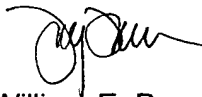
However, in view of the above amendments, this ground of rejection is moot.

Accordingly, in view of the above, it is believed that the present application is now in condition for allowance. Early notice to this effect is earnestly solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 07-1337 and please credit any excess fees to such deposit account.

Respectfully submitted,

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